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RS3 3rd Period

Problem 3)

a. The outcome being recorded is the adaptation score.
b. The study examines two factors: the participants themselves and the shock condition.
c. The subjects act as observational units with 18 levels. The shock treatment is the experimental factor with three conditions: shock during stuttering, shock after stuttering, and no shock.
d. Yes. This is a complete block design because each person forms their own block, and the treatments are randomly assigned within those blocks.

Problem 5)

a. The measured response is how fast the dogs run.
b. The two factors are the dogs and the diets they receive.
c. The dogs are the observational units (five total) with no imposed treatment. The diet is the experimental factor with three assigned levels.
d. This qualifies as a complete block design since each dog serves as a block, and all diets are rotated through each dog at different times.

Problem 24)

a. It would be incorrect to conclude that the scent caused the rats to finish the maze faster because the improvement might simply come from learning the maze through repetition rather than from the scent itself.
b. To eliminate practice effects, randomly assign subjects to one of four treatment sequences, mixing both Maze A and Maze B with and without scent in all possible pairings.

Problem 25)

a. A complete block design wasn't possible because once it rains, a cloud changes and can't be reused. You can't divide a cloud and treat only part of it, nor can you group clouds into blocks and selectively treat within the block.

Problem 26)

a. This is an experiment, and it is reasonable to assume that the list order was randomized.
b. The studied factor is the list number; the subject is considered a nuisance factor.
c. The experimental units are the individual time intervals during which each list is played.
d. There are n blocks (one per subject) and a total of 4n time intervals serving as experimental units.

Problem 28)

a. The experimental units are the specific time periods in which each treatment is applied. Treatments are randomized across these time slots so that all 24 possible treatment sequences (from the 4! permutations of I, F, A, P) appear equally.
b. Sample sequences include:
   $I \rightarrow F \rightarrow A \rightarrow P$
   $F \rightarrow A \rightarrow P \rightarrow I$
   $A \rightarrow P \rightarrow I \rightarrow F$
   $P \rightarrow I \rightarrow F \rightarrow A$

Problem 29)

a. The experiment could have treated each rat as a block consisting of two sessions, giving leptin first and insulin second, or the opposite order, with randomization controlling which comes first.
b. Reusing rats is problematic because earlier injections might influence their responses in later sessions. In addition, physiological changes such as aging or immune response could alter how they react over time.